



# Mitigating Emissions

## THE POWER OF A FULL PORT HIGH CV TOV

*In severe service industries, safety, reliability, and efficient operation are paramount. Environmental protection and emission reduction are typically difficult to balance. The performance requirements and demands on valves are often extreme, and usually, a single valve will not match all of the criteria.*

*In the push to maximize industrial capacity and efficiency, valve selection has always been challenging, often compromising exercise. Specific valve attributes need to be prioritized, creating the quandary of what features can be sacrificed to fit the system into the allotted budget.*

*With this in mind, the Crane engineers and development team conceived the idea for the FK-TrieX – a versatile, full port metal seated Triple Offset Valve – suitable for severe service and emission reduction applications.*

**By Crane ChemPharma & Energy,  
A business of Crane Co.**

### Superior Emissions Control

The objective of ISO 15848-1 is to enable classification of performance in different designs and constructions of valves to reduce fugitive emissions. This sealing section of the standard specifies the method of leakage measurement on packing. Measurement using a helium mass spectrometer is precise, reliable, and independent of operator and environment. This method allows measurement of the total gas escaping the valve stem packing. The below chart reflects the stem sealing performance of Crane FK-TrieX. This new high Cv TOV achieved ISO 15848-1 Tightness class AH, Endurance Class C03, SSA0 (with



no packing adjustments) at 400°C, significantly outperforming others. There are few other valves on the market able to deliver such superior stem sealing performance without the assistance of bellows seals.

### Bi-directional zero leakage

Employing all of the geometrical advantages of a triple offset sealing element, the Crane FK-TrieX achieves bi-directional zero leakage, certified to API 6D and API 598 specifications

– rarely seen in authentic full port design fully Pig-able fire-safe designs.

### High Cv allows for line size-reduction

The FK-TrieX surpasses the conventional TOV Cv by a factor of 4x to 8x+, making it an extremely important innovation for environments where limited flow causes contamination and clogging.

With its high Cv, it's an excellent candidate for new pipeline construction



as a lighter, smaller line size can be used, reducing the weight and thus, the structural support needed for the system.

### Ease of inspection, repair, and replacement

The proprietary end-entry securing and sealing configuration guarantees suitability for dead-end service while providing for the safe removal of the body seat for inspection and replacement. This body seat is the first-ever single-seat bi-directional valve design that meets API 6D specifications.

This seating can be easily resurfaced if the need arises and the body seat itself can be replaced, another first in the triple offset valve category.

Application	Typical Pain Point	FK-TrieX Solution
LNG - Molecular Sieve Packages	Need for High Flow with zero leakage, low weight and actuation cost, fire safe, high temperature	Maximum flow, bi-directional zero leakage and low torque
CHEMICAL - VCM/VCI Units - MDI/PMDI Units - Ethane Cracker	Cavity free, bi-directional zero leakage, large flow capacity, compact/ lightweight automation, solids handling	All pain points addressed
REFINING • FCC/CCR Units • Distillation Units • Hydrocracker Units - FCC/CCR Units - Distillation Units - Hydrocracker units	High Flow, Zero Leakage, High Temp, Fire Safe, low complexity and reparability	All points addressed
MIDSTREAM PIPING - Re-energization Stations - Piping - PIG Launchers / Receivers	Piggable, low-pressure drop, high flow, zero leakage	All points addressed

*All of these industries above are charred with limiting greenhouse gases and reduce hazardous/ dangerous chemical releases. Crane has prioritized this demand and incorporated a breakthrough steam sealing performance within the FK-TrieX standard design.*

### Decreasing compromise, boosting compliance

Design is engineered to address as many aspects of the valve selection matrix as possible, offering a wide range of materials, high flow, bi-directional zero leakage, low torque, light-weight, ultra-low emissions, fire-safe high-temperature resistance in a one-piece body configuration.

### Unmatched safety

CRANE FK-TrieX severe service isolation valves are designed for safety

on all fronts, safeguarding personnel, operations, and assets from fire and explosions, leakages, and environmental damage and carbon footprint.

The triple offset sealing mechanism provides the highest emission control standards, with certifications to API 641 and ISO 15848 AH C03 SSA0 at 750°F.

The Crane FK-TrieX also meets the rigorous standards of the API 607 fire test for quarter-turn valves confirming its pressure-containing capability during and after the test.

### Reliable Operations

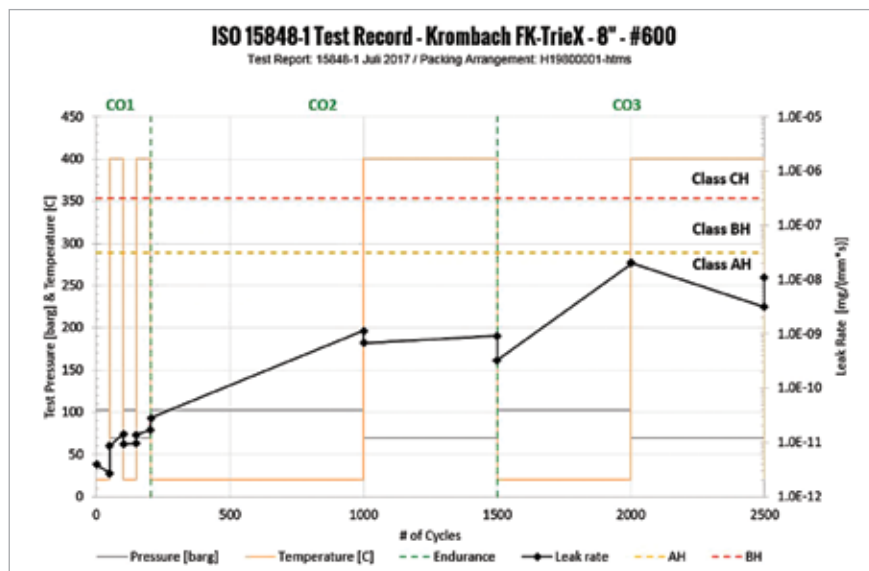
The innovative design also maximizes durability, reduces unplanned shutdowns from valve failures, and reduces planned valve maintenance time too, by more than 50%.

On the rare occasion where repair is required, the ease of serviceability and the ability to field repair the hard-faced seats ensures the lowest possible downtime for the operation.

This reliability originates from a few significant characteristics of the CRANE FK-TrieX:

- The frictionless sealing mechanism minimizes wear that is typically attributed to spring force and other impinging forces on the seat of the valve is absent in the FK-TrieX.

### ISO 15848 AH C03 SSA0 400°C Test



- The replaceable stellite powder plasma applied, welded seat with an RC hardness rating of 40 and flexible laminate seals provides excellent shutoff and approximately double the life of regular stainless-steel seats. The cavity-less self-cleaning design ensures solids are not trapped in valve crevices significantly reducing the likelihood of premature failure.
- Additionally, the API 6D standard full-bore design means that Pipeline Inspection Gauges (PIGs) and cleaning scrapers can pass through the valve in fully open condition, allowing for cleaning of the system without the need for valve removal.



*The innovative patent-pending design of the Crane FK-TrieX permits full bore operation with greater throughput and higher Cv all the while reducing your stem leakage, improving performance for consent decrees and improving efficiencies of LDAR programs.*



*Crane FK-TrieX body seat full port triple offset valve. The Crane FK-TrieX "full port triple offset ball valve" offers customers a way to maximize effectiveness and balance costs in severe service applications, thanks to its innovative engineering.*

### Lower overall operating costs

With its high Cv value it enables systems to realize upfront and long-term cost savings. The savings from smaller actuators, 20% lower structural support cost, and reduced planned maintenance cost of more than 50% all add up.

The modular seat design means the seat and laminate seals can be replaced individually, without having to replace the entire valve. Moreover, these replacements can be carried out in the field, eliminating the need to ship the valve to service centres.

The quarter-turn design ensured that the valve can be actuated and operated without complex and oversized actuators, further reducing set-up and operation costs. The single-piece body architecture of the valve reduces its weight by up to 20%, decreasing structural support costs. The single body design also means a reduction in possible leak paths.

Engineered with the same face-to-face dimensions as other technologies, and complying with the standard ASME B16.1 Long Pattern, means the FK-TrieX can be readily swapped with other standard valves, without creating modifications to the system

*\* Crane Co. is traded on the New York Stock Exchange (NYSE:CR). [www.cranecpe.com](http://www.cranecpe.com)*